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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 09/899,622
Filing Date: July 03, 2001
Appellant(s): APOSTOLOPOULOS ET AL.

John P. Wagner, Jr.
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed September 13, 2010 appealing from the Office action mailed May 12, 2010.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

1, 4-11, and 14-26.

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

**(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| U.S. 2001/0040871 | Abrahamsson et al. | 11-2001 |
| U.S. 2002/0040473 | Ehrman et al. | 4-2002 |
| U.S. 6,308,222 | Krueger et al. | 10-2001 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-11, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abrahamsson (U.S. 2001/0040871) in view of Ehrman (U.S. 2002/0040479).

As per claim 1, Abrahamsson teaches a method for streaming media data to a client, said method comprising: encoding an item of content comprising media data to be streamed to said client into a first multiple description bitstream and into a second multiple description bitstream, wherein said first multiple description bitstream and said second multiple description bitstream (MDB) each consist of complimentary information that is not duplicative and are decodable independent of one another such that said MDB is decodable without utilizing any information comprised within said second MDB and said second MDB is decodable without utilizing any information comprised within said first MDB (paragraphs 0016-0018, 0031-0034); distributing concurrently said first and second MDB throughout a network, such that said first and second MDBs are sent to said client via a plurality of transmission paths, wherein said client decodes said item of content at a first quality should only said first MDB be received at said client, wherein said client decodes said item of content at a second quality should only said second MDB be received at said client, and wherein said client decodes said item of content at a quality greater than either of said first or second quality should both said first and said second MDBs be received at said client (paragraphs 0016-0018, 0031-0034, 0037, 0039, 0048-0049, 0051).

Abrahamsson does not specifically teach the distribution of bitstreams to a plurality of servers placed at intermediate nodes throughout a network. Ehrman teaches the distribution of bitstreams to a plurality of servers and then allowing a client to receive the bitstreams from the plurality of servers (figure 1; paragraphs 0018-0023). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the ability to divide the bitstreams and send them to separate servers such that a client may receive the bitstreams from a plurality of paths, as taught by Ehrman in the system of Abrahamsson. The motivation for doing so lies in the fact that Abrahamsson contemplates path diversity through receiving packets from differing paths (paragraph 0037), but does not specifically disclose the differing paths correspond to differing servers. By including the transmission of data by different servers to one client, as taught by Ehrman in the system of Abrahamsson, transmission speed and system efficiency increases. All inventions are from the same field of endeavor, namely the streaming of multimedia through a network.

As per claim 4, Abrahamsson-Ehrman further teaches that said encoding further comprises: encoding said item of media data into a first and a second complementary multiple description bitstream wherein each of said first and second complementary multiple description bitstreams does not include encoded media data that is included in the other of said first and second complementary multiple description bitstreams (Abrahamsson: 0016-0018, 0031-0034).

As per claim 5, Abrahamsson-Ehrman further teaches that said item of media data is selected from the group consisting of audio-based data, speech-based data, image-based data, graphic-data, and web page-based data (Abrahamsson: 0016-0018, 0031-0034).

As per claim 6, Abrahamsson-Ehrman further teaches that said distributing further comprises: distributing said first multiple description bitstream to a first server and distributing said second multiple description bitstream to a second server (Ehrman: 0018-0023).

As per claim 7, Abrahamsson-Ehrman teaches the method for streaming media data to a client as recited in claim 1, wherein said client is a mobile client (Abrahamsson: 0012).

As per claim 8, Abrahamsson-Ehrman teaches the method for streaming media data to a client as recited in claim 7, wherein the step comprises: distributing said first and second multiple description bitstreams to servers placed along a wired/wireless gateway (Abrahamsson: 0016-0018, 0031-0034).

As per claim 9, Abrahamsson-Ehrman further teaches that said method does not require complete duplication of said media data in order to achieve path diversity (Abrahamsson: 0016-0018, 0031-0034).

As per claim 10, Abrahamsson-Ehrman teaches the method for streaming media data to a client as recited in claim 1, wherein said method is performed in a network system selected from the group consisting of: wired and wired networks; wired and wireless networks; wireless and wired networks; and wireless and wireless networks (Abrahamsson: 0016-0018, 0031-0034).

As per claim 11, Abrahamsson-Ehrman teaches a method for achieving reliability and efficiency and for reducing single points of failure in the streaming of media data to a client, said method comprising: encoding an item comprising media data to be streamed to said client into a first complementary multiple description bitstream and into a second complementary multiple description bitstream, each of said first and second complementary multiple description bitstreams consisting of complementary information that is not duplicative and not included in

the other of said first and second complementary multiple description bitstreams, and wherein said first multiple description bitstream is designed so that said item of a first quality is decoded by said client with only said first multiple description bitstream received at said client and without utilizing any information comprised within said second multiple description bitstream, wherein said second multiple description bitstream is designed so that said item of a second quality is decoded by said client with only said second multiple description bistream received at said client and without utilizing any information comprised within said multiple description bitstream, and wherein said item of a quality greater than said first or second quality is decoded by said client with both said first and said second multiple description bitstreams received at said client (Abrahamsson: 0016-0018, 0031-0034); and distributing concurrently said first complementary multiple description bitstream and said second complementary multiple description bitstream to a plurality of servers placed at intermediate nodes throughout a network, such that said first and second multiple description bitstreams are dispatched to said client via a plurality of transmission paths (Ehrman: 0018-0023).

Claims 14-19 are rejected on the same bases as claims 5-10 respectively, as claims 14-19 teach a method of implementing claims 5-10 respectively.

Claims 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abrahamsson-Ehrman in view of Krueger (U.S. 6,308,222).

As per claim 20, Abrahamsson-Ehrman teaches a system for streaming media data to a client, said system comprising: a first server having first memory coupled thereto, said first memory having a first multiple description bitstream of encoded said media data stored thereon,

said first server adapted to transmit said first multiple description bitstream to a client via a first path (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023); and a second server having second memory coupled thereto, said second memory having a second multiple description bitstream of encoded said media data stored thereon, wherein said first multiple description bitstream and said second multiple description bitstream each consist of complimentary information that is not duplicative and are decodable independent of one another such that said first MDB is decodable without utilizing any information comprised within said second MDB and said second MDB is decodable without utilizing any information comprised within said first MDB, and wherein said first and second MDBs have approximately a same bitrate (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023), said second server adapted to transmit said second multiple description bitstream to said client via said second path, said first and second servers concurrently transmitting said first and second multiple description bitstreams such that said first and second multiple description bitsreams are provided to said client via a plurality of transmission paths, wherein said client decodes an item of content at a first quality should only said first multiple description bitstream be received at said client, wherein said client decodes said item of content at a second quality should only said second multiple description bitstream be received at said client, and wherein said client decodes said item of content at a quality greater than either of said first or second quality should both said first and said second multiple description bitstreams be received at said client (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023).

Abrahamsson-Ehrman does not specifically teach that the second bitstream is transcoded to a reduced bit rate according to bandwidth requirements and capabilities. Krueger teaches the

transmission of data from a server to a client, and transcoding the data based on a variety of client requirements, including available bandwidth for its path through the network (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the ability to transcode data in view of bandwidth capabilities, as taught by Krueger in the system of Abrahamsson-Ehrman. The motivation for doing so lies in the fact that transcoding would allow for stream-quality commensurate with system capability, so as to optimize the user's experience. All inventions are from the same field of endeavor, namely the efficient streaming of data through a network.

As per claim 21, Abrahamsson-Ehrman-Krueger further teaches that the system further comprises: a content server coupled to said first server and said second server, said content server adapted to provide said first multiple description bitstream of encoded said media data to said memory coupled to said first server, said content server further adapted to provide said second multiple description bitstream of encoded said media data to said memory coupled to said second server (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023).

Claim 22 is rejected under Abrahamsson-Ehrman-Krueger on the same basis as claim 5, which is rejected under Abrahamsson-Ehrman, because claim 22 is a system for implementing the method of claim 5. The Krueger reference is necessarily included in the rejection of claim 22, as its parent claim, claim 20, is rejected under Abrahamsson-Ehrman-Krueger.

As per claim 23, Abrahamsson-Ehrman-Krueger teaches the system for streaming media data to a client of claim 20, wherein said client is a mobile client (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023)

As per claim 24, Abrahamsson-Ehrman-Krueger further teaches the system for streaming media data to a client, wherein said first server is placed along a wired/wireless gateway of a network (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023).

As per claim 25, Abrahamsson-Ehrman-Krueger further teaches the system for streaming media data to a client, wherein said second server is placed along a wired/wireless gateway of a network (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023).

As per claim 26, Abrahamsson-Ehrman-Krueger teaches the system for streaming media data to a client of claim 20, wherein first server and said second server reside within a network system selected from the group consisting of: wired and wired networks; wired and wireless networks; wireless and wired networks; and wireless and wireless networks (Abrahamsson: 0016-0018, 0031-0034; Ehrman: 0018-0023).

**(10) Response to Argument**

**(10.1) Abrahamsson Teaches The Concurrent Distribution of Multiple Description Bitstreams**

On page 10 of the Appeal Brief, Appellant asserts that "Abrahamsson does not teach or suggest distributing concurrently said first and second multiple description bitstreams," as claimed in claim 1. Examiner respectfully disagrees.

First, a brief background is provided. Paragraph 0004 of Abrahamsson teaches that an audio signal is converted into a bitstream, which is then divided so as to be distributed in data packets over a network. Paragraph 0016 teaches the use of multiple description bitstreams,

where the source encoder sends two different descriptions of the same source signal over two different channels. For example, one description may have one quantization level, and the second description may have another quantization level (Figure 1; paragraph 0043). If only one of the channels is working, the destination decoder reconstructs the source signal based only on that channel, at a certain quality. If both channels are working, the reproduced source signal will be based on both descriptions, and thus will have a higher quality. Paragraph 0018 teaches that this concept is implemented in the Abrahamsson invention. Further, paragraphs 0031 and 0035 teach that several representations of the same information are transferred, where "when all packets reach a receiver's end without loss/delay, the different representations are merged together before reproducing the speech/audio signal," and "if only one segment description was received, the sound segment is decoded based on that single segment description. The sound segment will then be reproduced with a quality that is sufficiently high."

Paragraph 0049 teaches the use of two different signal descriptions, indicated as $D_1$ and $D_2$, where the sound signal segments are labeled as n, n+1, n+2, etc. The description segments (the sound segments after encoding into descriptions) are labeled $D_1(n)$, $D_1(n+1)$, $D_1(n+2)$, etc., and $D_2(n)$, $D_2(n+1)$, $D_2(n+2)$, etc. These description segments are transmitted in packets over a packet-switched network to the destination. In Paragraph 0053, illustrating the second embodiment of the invention, it is disclosed that the encoder at "the transmitting end groups two individual packet segment descriptions of two consecutive sound segments together in each packet." Figure 5 illustrates this concept. Packet 522, for example, contains segments of both descriptions: $D_2(n)$ and $D_1(n+1)$. That is, both descriptions/bitstreams are traveling over the packet-switched network, where the given segments share one packet.

Because segments of both descriptions are transmitted over the network in one packet (and thus at the same time), it is respectfully submitted that both descriptions are transmitted concurrently.

Figure 6b and paragraph 0057 describe a situation in which packets 611 and 612 are lost. In this case, segments n+1 and n+3 are represented by only one description each, namely $D_1$, which fulfills the claim requirement that the destination "decodes said item of content at a first/second quality should only said first/second multiple description bitstream be received".

Therefore, Abrahamsson fully teaches the limitation of "distributing concurrently said first and second multiple description bitstreams," as claimed.

**(10.2) Abrahamsson Does Not Teach Away From The Claimed Invention**

Appellant asserts that "Abrahamsson teaches away from 'distributing concurrently said first and second multiple description bitstreams', as claimed". Examiner respectfully disagrees with this assertion, as it is inaccurate.

Appellant cites various passages in Abrahamsson, which state that "different segment descriptors are then transmitted in separate data packets at different points in time," and that "diversity is provided from multiple descriptions by transmitting/receiving different individual segment descriptions of the same sound segment in different packets at different time instances," as examples, asserting that this teaches away from the claimed requirement of concurrent bitstreams.

These cited passages apply to the first embodiment of the Abrahamsson invention. It has been shown above that the second embodiment of the Abrahamsson invention fully teaches the

claimed limitations and thus cannot teach away from them. However, it will be demonstrated below that the first embodiment also does not teach away from claimed limitations, and indeed also teaches the concurrent distribution of first and second multiple description bitstreams, as claimed.

The above-cited passages only state that the packets of the different descriptions are transmitted at different points in time. This does not mean that the entire descriptions (bitstreams) themselves are transmitted at different points in time, as asserted by Appellant. This is because a description/bitstream is made up of a finite series of discrete packets corresponding to that description/bitstream. That is, a packet is only a portion of a bitstream. Therefore, for two bitstreams to not be considered as being transmitted concurrently, one entire bitstream must be transmitted at a different time from the other (i.e. all packets of one bitstream are sent before or after all packets of another bitstream). This is clearly not the case in Abrahamsson, as Figure 4 shows that the packets of one description (421) are interleaved with the packets of another (422) until the entire descriptions are transmitted. In this way, the bitstreams are indeed transmitted concurrently until the transmission is complete, even though the packets are not sent simultaneously. As long as the packets of one description/bitstream are transmitted while there are still packets left to be transmitted for a second bitstream, whose transmission is in progress (i.e. the source has not yet completed sending the second bitstream), it can be said that the bitstreams are being transmitted concurrently. This is clearly the case in the embodiment of Figure 4 of Abrahamsson, where a packet of one description, $D_1$, is sent, followed by the packet of another description, $D_2$, is sent, until all packets are sent (i.e. the full bitstreams are sent).

Therefore, even though the packets of the bitstreams are sent at different times in Abrahamsson, the bitstreams as a whole are transmitted concurrently.

Further, there is no special definition in the specification of the term "concurrently" that differs from the common meaning in the art that would preclude the above interpretations. Therefore, it is clear that Abrahamsson fully teaches the claimed limitation of "distributing concurrently said first and second multiple description bitstreams," as claimed, and thus cannot teach away from it.

**(10.3) The Abrahamsson Reference Teaches Multiple Description Bitstreams**

Appellant asserts that Abrahamsson does not teach that the "client decodes said item of content at a first quality should said first multiple description bitstream be received at said client, wherein said client decodes said item of content at a second quality should only said second multiple description bitstream be received at said client, and wherein said client decodes said item of a content at a quality greater than either of said first or second quality should both said first and said second multiple description bitstreams be received at said client." Examiner respectfully disagrees.

As discussed above, paragraph 0016 of Abrahamsson teaches the concept of multiple descriptions, where the receiving decoder reconstructs the source signal at a certain quality, based on the description that is currently working, and if both descriptions are working, the reconstructed signal will be of a higher quality. This forms the basis of the Abrahamsson invention. Paragraph 0031 also teaches transferring several representations of the same information, where when all packets of the representations are received, the representations are

merged together. Paragraph 0035 teaches that if only one segment description is received, the sound segment is decoded based on that single segment description. Paragraph 0043 teaches two different descriptions that have quantization levels of their own, and when combined, have a higher quality quantization. In addition, paragraph 0051 teaches that "the Multiple Description Decoder 480 will for each sound segment extract the joint information from the different packets and decode the sound signal segment for transfer to a D/A-converter. If, for example, segment description $D_1(n)$ did not arrive at the receiver end, or arrived too late, the Diversity Controller 450 will only schedule $D_2(n)$ (if two descriptions are used) to the Multiple Description Decoder 480, which then will decode sound segment n of the sound signal with adequate quality from the single segment description $D_2(n)$ received." Therefore, the first embodiment of Abrahamsson clearly teaches that if either one description is received at the destination, the signal is reproduced based on that description, and if both descriptions are received at the destination, the signal is reproduced based on both descriptions, at a higher quality than with only one description. This clearly teaches the limitation as claimed, and also constitutes the basis of Multiple Description Coding.

Regarding the second embodiment, paragraph 0057 teaches that if packets 611 and 612 of Figure 6b are lost, the segment description of n+1 and n+3 will only be represented by one description, $D_1$. In this example, for segments n+1 and n+3, the decoding will only be at the quality of $D_1$. In Figure 6b, the decoding for segment n will be at the combined quality of $D_1$ and $D_2$, as the packets corresponding to both descriptions (609, 610) are not lost. Also, for example, if packets 610 and 611 were lost, but not 612, the decoding would only be at a quality level of $D_2$

for segment n+2. This then clearly constitutes the limitation as claimed, where receiving both descriptions will result in a higher quality signal than receiving any one acceptable description.

As such, Abrahamsson fully teaches that the "client decodes said item of content at a first quality should said first multiple description bitstream be received at said client, wherein said client decodes said item of content at a second quality should only said second multiple description bitstream be received at said client, and wherein said client decodes said item of a content at a quality greater than either of said first or second quality should both said first and said second multiple description bitstreams be received at said client," as claimed.

**(10.4) The Remaining Claims**

With respect to independent claims 11 and 20, Appellant has applied the same argument as that of claim 1. Therefore, the remarks discussed above apply to these claims as well. The remaining dependent claims stand rejected by the same rationale set forth in the Final Office Action, because no additional arguments were made with respect to the dependent claims.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Tanim M. Hossain/

Conferees:

/Ajay Bhatia/

Primary Examiner, Art Unit 2445

/HASSAN PHILLIPS/

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